9. Was Sx.; attempted to hang herself; flew into fits of temper; was slovenly, seclusive, indecent; at 32 had delusions of being poisoned; threw herself out of window.

10. Cut his throat with a razor.

11. Cut his throat as his father did.

12. Garrulous; jumps from one topic to another; has sudden emotional changes; said to have attempted suicide.

13. Had a nervous breakdown twice; is very hot-tempered; jumps from one topic to another.

14. An actress who is obstinate, irritable and passionate; after childbirth she became deranged and is now obstinate, silly and shameless; has attempted suicide.

15. A great talker; at 31 became violent, restless, noisy; developed delusions and hallucinations and threatened to commit suicide.

16. Contrary and stubborn; hyper-religious; became noisy, restless, sullen, had delusions.

17. Impulsive, irritable and passionate; became excited; attempted to shoot himself.

18. Quick-tempered; at 32 became excited; had acute mania.

19. Alcoholic, cross, irritable; at 37 threatened suicide; was excitable; had delusions and hallucinations.

20. Quick-tempered, had delirium tremens and hallucinations.

21. Sulky and impatient as a boy; drank; quick-tempered, homicidal and suicidal; has hallucinations and delusions.

22. High-tempered, extravagant; became insane and jumped out of window, killing herself.

23. At 20 became erratic, silly, irresponsible; wanted to travel and follow girls.

24. Obstinate, irritable and passionate as a child; became hysterical and tried to hang herself and kill her child.

These are a random half of his cases of the choleric-cheerful.

Is it not wise to delay acceptance of any simple Mendelian hypotheses for the inheritance of the strength of the tendencies to wander, to be excited, calm, elated and depressed, until the pedigree individuals are measured, or at least classified, by some criteria that are objectively definable? The reviewer welcomes the studies of the Eugenics Laboratory and appreciates the devotion that inspires them and the labor which sustains them. But he is left unconverted by each one —indeed, more confirmed in the faith, or fear, that human mental traits are due to a number of determiners or a variation in strength of the same determiner.

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A Comparison of Methods for Determining the Respiratory Exchange of Man. By THORNE M. CARPENTER. 265 pp.

Energy Transformations during Horizontal Walking. By FRANCIS G. BENEDICT and HANS MURSCHHAUSER. 100 pp.

Physiology of the New-Born Infant. Character and Amount of the Katabolism. By FRANCIS G. BENEDICT and FRITZ B. TALBOT. 126 pp. Publications Nos. 216, 231, 233. Carnegie Institution of Washington, Nutrition Laboratory.

The study of the respiratory exchange of man has long been, and will doubtless long continue to be, one of the most fruitful fields of physiological investigation. Its value rests chiefly upon this fact of supreme importance: namely, that alike during rest and exercise, in health and disease, the method of indirect calorimetry as calculated from the respiratory exchange affords measurements of the energy expenditures of the body which are in close agreement with direct calorimetric determinations. Not only are the technical procedures of the indirect method far simpler and more generally applicable than are those of the direct method, but the former also afford a deeper insight into the sources of the energy than do the latter. Thus from a measurement of the volume of the air expired in a given time, and an analysis of its content of oxygen and carbon dioxide, we can determine accurately the amount and the character of the food stuffs consumed in the body. From such data are to be deduced the dietetic needs of the clerk and the stevedore, the bread cards of a blockaded people, the ration of the marching soldier, the food needed by the new-born infant, and the requirements of the typhoid patient. With such data we may meet more

effectively "the high cost of living." It is altogether probable also that during the next few years determinations of the respiratory exchange will be extensively introduced into routine clinical use.

For these reasons there is a special timeliness in the thorough study of the principal methods now in use for the determination of the respiratory exchange in man, offered by Carpenter in the first of the publications above listed.

In general such methods fall into two classes: those involving a closed circuit on the Regnault-Reiset plan, and those involving a so-called open circulation. As the most complete working out of the closed circuit method the apparatus devised by Benedict has been especially studied in its various forms in the work before us. With the results so obtained Carpenter has compared particularly as examples of the open circulation the Zuntz-Geppert method and the method of Tissot, of which that of Douglas is a modification.

In all forms of the Benedict apparatus the subject continually rebreathes from a closed system of chambers, pipes and absorbers in which the air is kept in circulation by a blower. The total carbon dioxide exhaled is absorbed and weighed; and the total amount of oxygen required to replace that absorbed by the subject from the system is determined either by weight or volume.

In the Zuntz-Geppert method the subject inspires the outside air through valves and a mouthpiece, and expires through a meter connected with a sampling device. From the meter reading and the analysis of the samples the total oxygen absorbed and carbon dioxide exhaled are calculated.

In the Tissot method the subject also inspires outside air, but expires into a carefully counterbalanced and graduated spirometer, from which a sample is later taken and analyzed.

In the Douglas method the expired air is caught in a bag from which it is later forced through a meter: the respiratory exchange being determined by the meter reading and the analysis of a sample.

Carpenter finds that with care and skill practically equivalent results are obtainable with the Benedict, Zuntz-Geppert, and Tissot methods. With the Douglas bag the discrepancies are slightly greater, although in this case also inconsiderable.

Although Carpenter reaches no positive conclusion as to the superiority of the features of any one of the general methods above described, he does point out that the ability of the investigator to perform accurate gas analyses is of special importance; and that apart from the gas analyses the Benedict method is more complicated than the Zuntz-Geppert, Tissot or Douglas methods. He especially emphasizes the fact that for purposes of gas analysis the apparatus of Haldane is by far the most perfect yet devised. He makes the excellent suggestion that as a check upon the accuracy of the experimental data analyses of pure air also should always be made and reported.

The reviewer leaves this work with a strong impression, although perhaps Carpenter himself would disclaim any intention of creating it, that the best method now available consists in the use of a spirometer of the Tissot type (or for special purposes a Douglas bag) and a Haldane analyzer. Great as have been the contributions of the Benedict apparatus, it appears inferior to this form of the open circuit, alike in theory, in the complexity of its manipulation, and in the cost of installation.

In "Energy Transformations during Horizontal Walking" Benedict and Murschauser describe the results obtained from a man walking upon a treadmill driven at various rates of speed. The energy expenditure of the subject in a post-digestive condition, standing absolutely still, is first determined. By subtracting this basal value from the figures obtained during walking they compute the extra energy expended in moving the body per kilogram and horizontal meter. For slow paces a distinctly uniform figure is obtained. This increases, however, with rapid walking, a point being reached at which the energy expenditure of running is less than that of rapid walking. It is shown that the high rate of energy ex-

penditure during rapid walking is largely due to the swinging of the arms. In running they find that a great part of the energy is consumed in the up-and-down motion of the body. They point out that the elimination of these factors is the line along which economy of energy is to be obtained.

In the "Physiology of the New-Born Infant" Benedict and Talbot include a translation of an important paper by Hasselbalch hitherto not generally accessible. Hasselbalch concludes that a well-nourished infant born at full term has a store of carbohydrates upon which it draws during the first few hours of life with a respiratory quotient well up toward unity. Thereafter for a time the respiratory quotient is lower and the metabolism approaches a fasting character. These striking results are not fully confirmed by Benedict and Talbot. Although in some cases they also find a decidedly high respiratory quotient, they suggest that it is due to an excessive blowing off of carbon dioxide during crying. They demonstrate the relatively great amount of energy which an infant expends in this exercise, and point out that even under normal conditions the mother never supplies sufficient nutriment to balance the infant's output during the first few days after birth. They emphasize the importance of keeping the newborn infant from crying, and so far as possible from any muscular exertion, in order to conserve its initial store of energy.

In the introduction to this work the authors complain of "a disposition on the part of some investigators to relieve us of the responsibility of interpreting certain of our results." The reviewer has not ascertained who these culprits are, or the extent of their fault. He is inclined to offer as a defense for them, however, that the one defect of the splendid publications which come from the Carnegie Nutrition Laboratory is that they are confined in most cases too largely to a statement of the methods and experimental results, without summaries or even emphatic textual indications of the opinions which the investigators themselves have reached. Most authors who write thus receive the just punishment of being unread. It is only for work of the highest order that the sentence is commuted to mere misinterpretation.

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An Introduction to Neurology. By CHARLES JUDSON HERRICK. Philadelphia, The W. B. Saunders Company, 1915. Pp. 355, 137 figs.

This work is an example of marked success in the accomplishment of a difficult task. In dealing with such a subject as the nervous system it is probably easier to write a small book or a very large one than to produce a valuable one of medium size. One can write a short account of the mechanism, shirking the intricacies of its structure, and emphasizing what is picturesque and entertaining. Or, by taking more time, one can prepare a voluminous and impersonal account of it which shall serve for reference rather than consecutive reading. To write a book which shall be quite minute as to detail and yet concise and readable is a severer test of a man's scholarship and power.

The book in hand meets the requirement. The material is arranged with unusual skill and the presentation is masterly. The distinction is less in the freshness of the facts than in the selection made and the clarity of exposition displayed. Without indulging in digression or sacrificing accuracy the author has given his work a literary quality which is refreshing. There is a geniality about it all which to an exceptional degree establishes a rapport between writer and reader.

Without offering any objection to the author's choice of terms it may be in order to express regret that biologists can not agree upon the significance of the "sympathetic system." Professor Herrick makes it as inclusive as possible, that is to say, equivalent to the autonomic system of Langley. It seems clear that physiologists generally hold to the other conception, making the sympathetic the thoracico-lumbar autonomic. We commonly say that the heart is inhibited by the vagus and accelerated by the sympathetic fibers, yet